18

The Washington Post

SUNDAY, NOVEMBER 20, 1966

A Hereditary Tummy-Ache?

By Joshua Lederberg

Science and Man

LACTOSE IS THE special sugar found in the milk of all mammals except certain sea lions, so far as is known, and including man. Infants, whether pups, calves or babies, must therefore produce the corresponding enzyme, lactase, to split the milk sugar into its constituent simpler sugars, glucose plus galactose.

Glucose is a rather common currency of food calories, because it is the chemical unit of all starches. Galactose is eventually converted to glucose in the body, but it is also an essential component of cell-membrane structures, especially of the developing brain—a possible clue, and perhaps a misleading one, as to why the special sugar, lactose, appears in milk.

Another guess might be that milk glands have an easier task depositing lactose in the secreted milk without reabsorbing it, as might happen with glucose. At any rate, the general pattern is that milk glands manufacture lactose and the infant's small intestine digests it.

EXCEPT FOR MAN, who drinks the milk of cows, most adult mammals do not encounter lactose in their diet and tend, as they mature, to lose the capacity to digest it.

Recently, several reports have appeared suggesting racial differences in the presistence of the digesting capacity in adult humans. One such report was published by Drs. T. M. Bayless and N. S. Rosensweig of Johns Hopkins medical school in the A.M.A. Journal for Sept. 19. It came to my attention just after I had written in this column that no scientific test on blood could distinguish the vast majority of whites from Negroes, and it might appear to refute the spirit if not the letter of that remark.

The investigators examined 20 whites and 20 Negroes, randomly chosen healthy volunteers from the Maryland State House of Correction. Nineteen of the Negroes complained of intolerance to milk; only one of the whites complained. This dietary response was highly correlated with biochemical tests for lactase.

The authors concluded that deficiency in this enzyme accounted for the milk intolerance. They speculated that this was a hereditary trait. It might have an evolutionary basis in the non-availability of cow's milk, therefore milk as adult food, to the African ancestors of the Negro subjects. The speculation is a reasonable one and is supported by the reports of frequent milk intolerance among Bantu tribesmen in Uganda. However, other tribes do not show milk intolerance, and West Africa, presumably the main ancestral home of American Negroes, has not been studied.

IT WOULD BE of great scientific interest to find a clearcut biochemical characteristic that could serve as a hereditary marker of racial difference in the United States, even though it varies from the tribe to tribe in Africa. Intestinal lactase, or more simply lactose tolerance, is an easily measured characteristic. Some fairly simple family studies could quickly determine whether adult lactase is a simple hereditary factor or not.

However, these have not been done, and the hereditary basis of lactose intolerance is a speculation to provoke further inquiry, not a fact.

Drs. A. Prader and S. Auricchio of Zurich, Switzerland, writing in the Annual Review of Medicine, have summarized their experience with sugar intolerance over a period of years. Surely most of their patients were white. They remark that many common intestinal diseases were followed by difficulties in the utilization of lactose.

We should then wonder whether milk intolerance among the apparently healthy Negroes was caused by past intestinal disease in some way not immediately evident from a medical examination.

FINAL JUDGMENTS should await detailed genetic analysis. The incidence of milk intolerance among the 20 Negroes was, however, suspiciously high in relation to estimations of the historic crossbreeding of Negroes and whites. The tribal differential in Uganda is likewise almost too sharp for a hereditary trait.

These discussions of hereditary versus environmental causation of racial quality have a familiar ring. Unlike I. Q. tests or economic performance, however, adult lactase is purported to be a simple hereditary trait, and we should know before long.

As Bayless and Rosensweig point out, these dietary idiosyncracies have some social importance insofar as milk is such an important aspect of our diet. If intolerance to lactose is a hereditary characteristic, or else for some other reason not easily evaded, the acculturation of the Negro to milk would be one more cryptic insult we would have to clear up in any honest program of equal opportunity.

This means finding out whatever we can to build the scientific basis of maximizing every individual's unique potentialities, whether by adapting his diet to his enzymes or his schooling to his intellect.